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DISEASES OF TREES AND ORNAMENTALS

FIELD OBSERVATIONS OF NEEDLE RUSTS OF SPRUCE IN MINNESOTA

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In the summer of 1927 a needle rust of spruce appeared in epidemic form in northern Minnesota. The regional distribution of the disease in the State corresponded to the range of the swamp evergreen heath plants, Labrador tea, Ledum groenlandicum; leatherleaf, Chamaedaphne calyculata; and bog rosemary, Andromeda glaucophylla. These plants became heavily infected with the alternate stage of the causal organisms later in the summer. The infected spruce were the cause of considerable concern to foresters, nurserymen, and owners of ornamental spruce plantings because epidemics of a similar nature had been infrequent, and little information was available on the nature and extent of the resulting damage. The prevalence of the disease during 1927 on ornamental as well as on native spruce growing under natural conditions afforded an excellent opportunity to add to the meager information concerning such epidemic attacks.

Notes on Infection. Immature aecia were first reported on spruce on July 14. Shedding of the spores began towards the latter part of July and continued for three weeks in August. Although infection was limited to the current year's growth, aecial production, especially in the case of native black and Colorado blue spruce growing in areas of heavy attack, was so abundant that the foliage in mass assumed a yellowish color. The aecial pustules occurred in irregular rows, sometimes definitely 2, on the under side of the needle, and varied in number from 3 to 9 but were usually 5 to 6. Trees of all ages were

attacked, infection being heaviest in the leaders and upper portions of small trees under 8 feet in height. In the larger trees, infected needles were confined for the most part to the lower portions of the crown. The relative susceptibility of several species of spruce growing side by side in forest nurseries was observed to be as follows: susceptible - black spruce, Picea mariana, and Colorado blue spruce, P. pungens engelmanni; moderately susceptible - white spruce, P. glauca; resistant - Black Hills spruce, P. glauca albertiana, and Norway spruce, P. excelsa.

The heath plants, leatherleaf, Labrador tea, and bog rosemary, were usually found in the immediate vicinity of infected spruce although in the case of one nursery which contained rusted trees, the nearest plants found were one-half mile distant. Examinations were made of these plants at intervals during the month of August. The small red to yellow uredinial pustules were first noticed on August 16 on leatherleaf growing in the vicinity of heavily rusted black spruce. By the latter part of August this stage had become prevalent on both leatherleaf and Labrador tea, being hypophyllous in the case of the former, and predominantly hypophyllous but occasionally epiphyllous on Labrador tea. Comparatively little infection was found on bog rosemary even where heavily rusted plants of the other two species were in close proximity. Uredinial production continued through the months of August and September and was heaviest on those plants growing close to or under diseased spruce. Infection was most common on the thin small leaves which had not yet become leathery and were relatively free of tomentum. An examination of infected areas made in March, 1928, revealed only uredinia on old leaves. Clinton (Conn. Agr. Exp. Sta. 1907/08: 369-396. 1908) reported finding uredinia in January on living old plants, and believed them to be capable of overwintering.

Nature and Extent of Injury to Spruce. Infected needles were being shed even before the aecia had ceased to liberate spores. Where heavy infection occurred, as on small trees and in the lower portions of the crown of large trees of black and Colorado blue spruce, it was estimated that from one-fourth to three-fourths of the current year's needles were lost by the end of the summer. Defoliation was slight in the case of white spruce and was of little or no consequence on Black Hills and Norway spruce. Whether such defoliation as occurred on black and Colorado blue spruce retarded growth or resulted in permanent injury was not established definitely. Reports received in 1928 from foresters and nurserymen indicated that the infected trees had recovered to the extent that little evidence remained of the heavy attack of the previous year. No killing or apparent deformation of the infected trees had occurred although it was reported by several that growth had been retarded slightly. The effect of several successive years of defoliation could not be determined because only light attacks of the rust occurred in 1928 and 1929. It is probable that successive epidemics would result in pronounced retardation of growth and possibly in permanent injury to heavily infected trees.

The only known previous reports of injury to spruce caused by the needle rust fungi are those of Clinton, who states that needles infected with Melampsoropsis cassandrae appeared as though they would be shed prematurely; and of Fraser, who describes killing of young plants by heavy pycnial infection in inoculation experiments with one of the rust fungi.

Causal Organisms. Three closely related and very similar needle rust fungi have been described as occurring commonly on spruce, namely; Melampsoropsis abietina (Alb. & Schw.) Arth., M. ledicola (Pk.) Arth., M. cassandrae (Pk. & Clint.) Arth. These have as their alternate hosts evergreen swamp plants belonging to the heath family, principally leatherleaf, Labrador tea, and bog rosemary. The host relationships of two of these, M. abietina and M. ledicola, were established by Fraser (Mycologia 3: 67-74. 1911) in 1910 and 1911 through studies conducted under both field and controlled conditions. The relation between Peridermium consimile and M. cassandrae was shown by Clinton in 1908 (Conn. Agr. Exp. Sta. Ann. Rept. 1907/08: 369-396. 1908) and this work was later substantiated by Fraser. The aecial stages of all 3 of these organisms appear as needle rusts on spruce and are very similar morphologically and therefore difficult to differentiate. The uredinial stages are more readily distinguished, those of M. abietina and M. ledicola being hypophyllous and epiphyllous forms respectively on Labrador tea; while that of M. cassandrae occurs as a hypophyllous form on leatherleaf.

In an effort to establish the identity and relative prevalence of the organisms concerned in the epidemic of 1927, examinations were made of the aecial and uredinial stages both in the field and in the laboratory. The distinguishable differences in the aecial stages were found to be insufficient to permit determination of the causal organisms on spruce. Since the uredinial stages of all 3 organisms were found on the heath plants, there was evidence that all were concerned to some extent. The heaviest infection occurred on leatherleaf, which suggested that M. cassandrae was at least common, and probably most prevalent. On Labrador tea, the uredinial sori were predominantly hypophyllous, indicating greater prevalence of M. abietina than of M. ledicola.

A number of inoculations of leatherleaf and Labrador tea were made in the field and in the greenhouse with the purpose of obtaining supplementary evidence on relative prevalence. A search for a rust-free area was unsuccessful; consequently plants growing in areas of light infection had to be used. In the field inoculations, 10 apparently uninfected plants of each species growing in situ were sprayed with fresh aecial material collected from black and Colorado blue spruce. Within 20 days all 20 plants showed infection, the uredinial sori being hypophyllous in all cases and more abundant on leatherleaf than on Labrador tea. Uninoculated plants in the immediate vicinity

of the sprayed ones were either free of infection or showed light attacks only on the lower sides of the leaves.

For the greenhouse studies, 40 plants of each species, together with the moss and substratum in which they were growing, were taken to the University Farm and potted immediately. Thirty plants of each species were sprayed with aecial material collected from infected spruce in the field, and 10 were kept as controls. A number of the plants soon showed evidences of loss of vigor as a result of transplanting, and several had withered before the incubation period of 21 days was completed. Of the 60 inoculated plants, 7 leatherleaf and 2 Labrador tea developed uredinial pustules on the lower sides of the leaves. Of the controls, all except one leatherleaf remained free of rust, infection in this one case probably having occurred while the plant grew in the field.

The meager infection results obtained in the inoculation studies permit no definite conclusions. It is interesting to note, however, that they tend to strengthen field observations, which indicated that M. cassandrae was very common on spruce, and that M. ledicola was of little significance.

Summary. A needle rust of spruce appeared in epidemic form in Minnesota during the summer of 1927. The relative susceptibility of spruce growing in forest nurseries was observed to be as follows: susceptible, black and Colorado blue spruce; moderately susceptible, white spruce; resistant, Norway and Black Hills spruce. Defoliation in the case of heavily infected plants amounted to from one-fourth to three-fourths of the current year's needles. Reports received in 1928 indicated that no killing or permanent deformation of the infected trees had resulted.

Field and laboratory examinations of the uredinial stages of the causal organisms on heath plants indicated Melampsoropsis cassandrae to be very common; M. abietina to be fairly common; and M. ledicola to be of little significance. Inoculation studies on leatherleaf and Labrador tea tended to strengthen the above conclusions as to the relative prevalence of the several fungi.

BLIGHT ON COTONEASTER IN ARKANSAS

H. R. Rosen

A severely diseased limb of Cotoneaster pannosa, known here as the silver leaf Cotoneaster, was received today from Mr. G. W. Ware, Assistant Director, in charge of the Fruit and Truck Branch Experiment Station, Hope, Arkansas. Mr. Ware notes that the disease affects the plants "somewhat similar to blight." "The limbs start dying at the tops and gradually works toward the base of the plant.

Practically all of these plants on this station are diseased in this manner. In some cases half of the plants are dead."

The diseased limb shows typical symptoms of the blight due to Bacillus amylovorus, including the presence of bacteria within the tissues. Cultures are being made to verify the diagnosis. This is apparently the first report of blight on Cotoneaster east of the Rockies.

MISCELLANEOUS REPORTS ON DISEASES OF ORNAMENTALS

ASTER YELLOWS IN PENNSYLVANIA: I am told that aster yellows (virus) is more common this year in western Pennsylvania than usual. (Geo. L. Zundel, July 21).

HOLLYHOCK RUST IN PENNSYLVANIA: Hollyhock rust (Puccinia malvacearum) is unusually abundant in the State this year and we have to diagnose one or more specimens every day. (Geo. L. Zundel, July 21).

F R U I T D I S E A S E S

TWO PHYTOPHTHORAS OF CITRUS FOUND IN NEW LOCALITIES

H. S. Fawcett

During a trip to Florida in January, 1932, Phytophthora citrophthora (Sm. & Sm.) Leonian was isolated from oranges affected with brown rot lying on very wet soil near Wildwood, and from grapefruit lying in wet irrigation ditches near Vero Beach and near Palmetto. It was also isolated from oranges taken from the orchards and a packing house at Buras, Louisiana. It is probable that P. citrophthora has been in Florida and Louisiana for a long time, but this is the first time it has been definitely reported.

In February, 1932, P. hibernalis Carne was isolated from orange fruits affected with decay identical with brown rot produced by P. citrophthora near Cucamonga, California. It is now believed, for reasons that will be published later, that P. hibernalis has been in California for some time, along with P. citrophthora, producing an identical type of decay.

The identification of P. citrophthora has been confirmed by S. F. Ashby who has also kindly identified P. hibernalis.

AN UNUSUAL RUSSETING OF YORK IMPERIAL FRUITS

F. J. Schneiderhan

During the last two weeks of July, a severe russeting of York fruits occurred in the Shenandoah apple belt. Previously, the fruits had developed water-soaked areas similar to those in fruit injured by water core. The water-soaked area affects only the epidermal layer as is shown by the superficial character of the russet which can be scraped off by the fingernail or with a knife.

The first water-soaked areas appeared early in July while the russeting followed from a few days to two weeks later. At this writing, August 3, there is considerable incidence of the water soaked fruits which will subsequently become russeted. The russeted area is fawn colored like that due to frost injury but slightly lighter.

From my own observations and those of several other observers, it appears that the heaviest damage occurs on lightly laden, and the least on heavily laden trees. There is slightly more russeting in the upper than in the lower branches. However, it has been found in all parts of individual trees. The russet on individual fruits is limited to the equatorial area and is rarely found at the calyx or stem end. The side facing the trunk shows more russet than the outer side.

That this russet is not the result of spray injury is shown by the fact that it is found on unsprayed trees. It would not ordinarily be confused with spray injury because of the solidly russeted areas and the freedom from calyx-end injury.

A count made in a York orchard near Kearneysville, West Virginia, showed that 45 per cent of the crop was russeted. This count was made on twenty trees and only the lower branches were examined. Some trees showed 100 per cent injury. It is probable that the average percentage of russet in the Shenandoah apple belt will be not less than 20 per cent which indicates that there will be a heavy loss from this cause alone, in spite of the fact that the York crop is lighter than usual.

A similar, if not identical occurence of russet was reported from the Winchester Field Laboratory about six years ago. It was limited to a few orchards at that time. The present widespread occurrence of this disease is probably unprecedented and has caused innumerable inquiries from apple growers most of whom seem to consider it to be the result of spray injury.

There has been no unusual weather factor to cause this injury. We have had less than normal rainfall but no excessive temperatures. No explanation of the cause of this trouble is ventured except to shuffle it into the convenient category of "physiological disturbance of York Imperial apples."

PEAR SCAB IN NEW YORK

W. D. Mills

Considerable amounts of pear scab (Venturia pyrina) are present this year in commercial pear orchards in eastern Wayne County and in Oswego County.

The maximum infection in a sprayed orchard occurred in an orchard of Clapps Favorite and Seckel pears near North Rose. In the early summer of 1931 15 per cent of the Clapp fruits were found to be infected with none on the Seckel fruits. In 1932 this orchard received a Bordeaux-oil dormant spray for pear psylla, an application of lime sulphur 1 - 40 at the cluster bud stage and a dry-mix spray about one week after the petals fell.

A count of Seckel fruits on June 7 showed 81 per cent scabbed while 18.7 per cent of the Clapp fruits were infected. A second count made with R. J. Haskell on July 14 showed substantially the same percentage of Seckel fruits scabbed while the percentage of scabby Clapp fruits had increased to 89 per cent.

A special application of a fungicide prior to the cluster bud was advised following the outbreak in 1931 but was not applied by the grower. The first scab infection in this area in both 1931 and 1932 was before pear bloom. (Aug. 5).

OCCURRENCE OF VERTICILLIUM WILT OF PEACH IN NEW YORK

W. D. Mills

Monroe County Agent R. C. Coombs found five peach trees showing wilt in a planting of 45 trees near Charlotte, New York, on July 2, 1932. When the planting was visited with Dr. R. J. Haskell on July 14, 20 trees were definitely showing the disease with two others suspicious. On revisiting the planting July 27 with Dr. Neil Stevens 32 trees of the 45 were definitely affected. A fungus agreeing with Verticillium alboatrum in cultural characters was isolated from a diseased tree July 15.

The peaches were all the South Haven variety from a Michigan nursery planted in 1930. Tomatoes were interplanted in 1930 and according to the grower were healthy. Cobbler potatoes were inter-

planted in 1931 and these blighted but the grower assumed this was late blight. Another planting on a neighboring farm from the same shipment of trees was examined in company with Dr. Haskell and this planting was apparently healthy.

In 1924, Dr. M. F. Barrus found 2 peach trees affected with wilt near Medina, Orleans County. He isolated a Verticillium and produced a wilt of egg plant with the fungus. E. F. Guba reported that the disease was also observed in Monroe County in 1924. No other records of this disease of peach in New York State have been found.

BACTERIAL SPOT OF STONE FRUITS (BACTERIUM PRUNI)

Pennsylvania: Our attention has just been called to the fact that bacterial gummosis is present in the State in somewhat large amounts. I have just examined a specimen from Canton, Bradford County, and from information reaching this Office, this disease is extremely severe in Erie County. (Geo. L. Zundel, July 27).

New York: Orleans County - Several complaints made of severe damage from bacterial leaf spot on peaches. One orchard almost entirely defoliated. Some trees absolutely bare of foliage. Fruit nearly all dropped. (E. R. Wagner, State Coll. Agr. Weekly News Letter, Aug. 1).

MISCELLANEOUS REPORTS ON FRUIT DISEASES

AERIAL CROWN GALLS OF THE APPLE IN GEORGIA: Considerable crown gall was found in one orchard in Rabun County. A varietal peculiarity was noted with Rome Beauty. On several hundred trees the writer found many small galls, usually on large limbs, which were about one-half inch in diameter and about that height. These small knots had the bark pushed up, but they never were completely erumpent.

Adjoining Rome Beauty, Red Astrakan was also infected, but in the usual manner for this section. Here the gall area varied from one to four inches in diameter and the surface was covered with many small sharply pointed intumescences. (J. H. Miller, June 28).

CEDAR RUST IN NEW YORK: Cedar apples of the hawthorn rust (Gymnosporangium globosum) were found on one of two red cedars in the fruit area of Oswego County. No evidence of apple rust or quince rust could be found on the cedar. Adjoining apple trees showed no rust lesions. (W. D. Mills, Aug. 5).

Apple rust (Gymnosporangium juniperi-virginianae) is making the foliage of Jonathan trees look sick in some orchards in Dutchess County and defoliation may result. (J. A. Evans, State Coll. Agr. Weekly News Letter, Aug. 8).

YELLOW LEAF CONDITION OF PEACHES IN PENNSYLVANIA: Peach orchards in Adams and Franklin counties have been showing a yellow leaf condition with some dropping of the leaves. Orchards that had no arsenical spray applied are showing this condition, and so that excludes the possibility of arsenical injury. Evidently the cause is a combination of weakening of the trees, caused by drouth, over-bearing last year and under feeding during the past few years, coupled with cloudy, rainy weather of the early part of this season. (R. S. Kirby and R. J. Haskell, July 12).

POWDERY MILDEW ON RASPBERRY IN MAINE: Infected leaf received from grower who called it Latham variety. Is first instance of powdery mildew on raspberry in this State, according to our records. (Donald Folsom, July 28).

C E R E A L D I S E A S E S

STEWART'S BACTERIAL DISEASE OF CORN IN NEW YORK

Charles Chupp

Before 1932 this disease had been reported only from the southern tier of counties (including twice at Ithaca), a few isolated plants up State and on Long Island and in the Lower Hudson Valley. This year Dr. Cunningham of the Riverhead Experiment Station reports it as very serious in both Nassau and Suffolk counties on Long Island and Mr. Mihalko, county agricultural agent of Rockland County, a very intensive sweet corn section, reports that a large percentage of their crop is being lost due to the bacterial wilt. Yesterday Dr. Neil Stevens and I visited fields in Chemung County, where we found it present on every farm inspected. Most of the plantings showed only traces, but there was a small patch that showed 20 per cent loss, and another almost 80 per cent. It is rather common along Lake Erie in Chautauqua and Erie Counties, as far north as Buffalo. A trace has been found in Monroe County near Rochester. All of the "North Country" of the State seems to be free from the disease.

It is very evident that the earliest varieties are most susceptible, and there is some indication that the earliest yellow, such as the Extra Early Golden Bantam, Golden Gem, Golden Sunshine, etc., are more susceptible than the very early white varieties. Late varieties, even when planted near infested fields, seem for the most part to be free of the disease. It has been found also on pop corn and field corn especially on flint corn although never in large amounts.

It is rather difficult to decide what control measures to recommend. Even when perfectly healthy seed is planted, a large percentage of infection may occur in communities where the disease was present the preceding year. Apparently insects carry it from old refuse. We are suggesting that the infested crop be destroyed completely immediately after harvest, and the field plowed deeply. If then healthy seed is obtained from as far north as possible, all of the precautions available are taken. It may be necessary if the epidemic continues, for growers to revert for a year or two to late white varieties in localities where the disease has been serious. (Aug. 5).

V E G E T A B L E D I S E A S E S

VEGETABLE DISEASES IN NEW YORK

Dr. A. G. Newhall contributes the following reports (August 5):

ONION MILDEW (PERONOSPORA SCHLEIDENI) SEVERE THIS YEAR: The season of 1932 will go down as another onion mildew year in New York State after two years with almost none. Frequent showers in late June and early July brought on the blight earlier than usual (July 15). Since then it has been reported very damaging from all six of the chief onion counties of the State (Genesee, Orleans, Wayne, Madison, Orange, and Oswego). Set onions are being harvested now (August 4) in western New York and will suffer much less than the later crop of seeded onions which needs 3 weeks to go yet. A preliminary estimate of at least 15 to 20 per cent loss does not seem out of the way.

CLADOSPORIUM LEAF MOLD OF TOMATOES: Early spring primary infections of greenhouse tomatoes with Cladosporium fulvum in the Irondequoit district resulted in severe losses by mid-summer. One large grower admitted a decrease in yield of at least 3 tons on his six houses. Many other smaller growers were similarly hit. This augurs for trouble on the fall crop which is now well through the ground.

SOLUBLE SALT INJURY: Several greenhouse vegetable growers suffered losses from an excess of soluble salts in the early summer. On radishes the symptoms were, a stunting accompanied by either a constriction of the root at the surface of the ground or a lopsided growth or only a roughened skin similar to fertilizer injury on potatoes. On tomatoes the symptoms were a stunting accompanied by a dark green color of the foliage. Lettuce was very much stunted and its roots appeared to be rotted off near the surface of the ground or at least browned, but no pathogene could be consistently isolated.

The trouble was cleared up by thoroughly soaking the ground with water to leach out the salts, which analysis showed in some cases to be over 2 per cent.

VEGETABLE DISEASES IN NEW MEXICO

Reported by R. F. Crawford, (July 25).

POTATO: Our extension horticulturist reports that approximately 50 per cent of the potato crop in the Virden Valley of New Mexico is affected by scab (Actinomyces scabies).

Psyllid yellows (virus) of potatoes is extremely severe in the Mesilla Valley this season. Early blight (Alternaria solani) of potato is also serious in the higher altitudes where potatoes are grown.

SUGAR BEET: This summer we had a very severe outbreak of Puccinia sarcobati on the sugar beets raised for seed purposes.

TOMATO: Curly top (Western yellow blight; virus) is extremely prevalent on the tomato crop.

CANTALOUPE: Macrosporium cucumerinum is prevalent in the Pecos and Mesilla Valleys.

D I S E A S E S C A U S E D B Y N E M A T O D E S

ERADICATION OF THE BULB NEMA TYLENCHUS DIPSACI FROM THE NEW YORK ONION DISTRICT

A. G. Newhall

Last year a small but severe infestation of Tylenchus was brought to the attention of Dr. Chupp in one muck field of onions near Canastota. The diagnosis was confirmed by Dr. Steiner and reported in the Plant Disease Reporter. (Vol. 15, No. 9, p. 92. 1931).

Vigorous steps were taken to eradicate the pest from this field by steam sterilization, inverted pan method. The town of Canastota furnished a steam boiler, the New York State College of Agriculture undertook the work under the direction of the writer, and the State Department of Agriculture paid the bill for steaming 1/3 of an acre at a cost of $230. Three men were kept busy for 6 days.

Although no onions were grown this year on the portion of the field steamed, it being devoted to early lettuce and late celery, nevertheless onions were grown all around this half acre. To date 3 inspections in which 5 or 6 people took part have failed to reveal any trace of Tylenchus-affected onions in this vicinity.

According to the grower this infestation was of at least 2 years standing, was definitely on the increase, and was fatal to onions in the center of the spots. Therefore it seems possible that a catastrophe of considerable importance may have been averted.

MISCELLANEOUS NOTES ON NEMATODE DISEASES

G. Steiner and Edna M. Buhrer

The root-knot nema, Caconema radicicola, was found in a new host, the India gingerlily (Hedychium gardnerianum), grown in either Jamaica or Guatemala, and brought to our attention by Mr. D. P. Limber at the Inspection House.

The bulb or stem nema, Tylenchus dipsaci, has been found in a specimen of Phlox decussata from Roland Park, Baltimore, Maryland, and Aphelenchoides fragariae (= A. ritzema-bosi) was also found in Phlox decussata from a Washington, D. C. planting.

SPECIMENS RECEIVED

Aphanomyces raphani Kendrick, black root of radish, C. A. Ludwig, Washington, D. C., August 6. Det. Charles Drechsler.

Ascochyta viciae Lib. on Vicia sp., Raleigh, North Carolina, February 1, S. G. Lehman. Det. V. K. Charles.

Botrytis cinerea Auct. causing bud blight of rose, from Jefferson City, Missouri, A. C. Burrill, June 8. Det. Lucia McCulloch.

Coryneum sp. on dewberry, Fisher, Arkansas, January 20, V. H. Young. Det. V. H. Young and P. R. Miller.

Cylindrosporium rubi Ell. & Mart., Franklin, Venango County, Pennsylvania, E. G. Ifft, county agent, June 23. Det. C. L. Shear.

Diplodia natalensis Ev., stemrot of peanut, Brazos County, Texas, July. Det. Neil E. Stevens.

Erysiphe polygoni DC., on Astilbe arendsii, Amherst, Massachusetts, W. H. Davis, July 26.

Macrophomina phaseoli (Maubl.) Ashby, ashy stem blight of snap beans, Concord, North Carolina, S. G. Lehman, August 9. Det. L. L. Harter.

Nummularia atropunctatum (Schw.) B. & C. on Quercus velutina, from L. R. Tehon. Collected by L. E. Sawyer, Neoga, Illinois, February 12. Det. C. L. Shear.

Ovularia nymphaearum Allesch. on Nymphaea, Seattle, Washington, Mary G. Neville, July. Det. Thelma B. Post, verified by Edith K. Cash. This seems to be the first report for the United States, although Gloeosporium nymphaearum, which is given as a synonym, has been reported from New York.

Peronospora viciae (Berk.) D. By., H. P. Barss, from dike land along the Columbia River, near Portland, Oregon, July 11.

Phomopsis sp. on fuchsia, Hollins College, Virginia, Ida Sitler, February 2. Det. Thelma B. Post.

Sphaelotheca seymouriana Clinton on Andropogon virginicum, Raleigh, North Carolina, Oct. 1931, S. G. Lehman. (Received February 29, 1932). Det. P. R. Miller.

Tubercularia vulgaris Tode on Albizzia julibrissin, Virginia, March 21, D. P. Limber.

Urocystis agropyri (Preuss.) Schroet. on Agropyron repens (quack grass), Geo. L. Zundel, Middlebury Centre, Pennsylvania, June 30. Killing grass in a rather large area.

Urocystis cepulae Frost on onion, Glenwood, Pennsylvania, Geo. L. Zundel, June 15. Severe infection in spots.

Volutella buxi (Cda.) B. & Br., Augusta, Georgia, Geo. T. Skinner, February 1. Det. T. B. Post and Freeman Weiss., on box.

SOME FUNGI FROM ALABAMA

Some fungi collected by G. W. Carver of the Tuskegee Institute are given in the following list. Most of the determinations were made or verified by C. L. Shear; some by N. E. Stevens or P. R. Miller.

Botryosphaeria ribis Gross. & Dug. on Sterculia platanifolia.

Caryospora callicarpa Curr. on oak railroad tie.

Eutypa ludibunda Sacc. on Ilex vomitoria and privet (Ligustrum sp).

Hendersonia desmazieri Mont. on Platanus occidentalis (sycamore). Unusually abundant.

Melomastia sp. on privet.

Nummularia clypeus (Schw.) on Acacia filiculoides.

Physalospora sp. on Euphorbia preslii.

Physalospora (?) malorum (Pk.) Shear on Canna indica.

Physalospora malorum (Pk.) Shear (probably) on Liquidambar styraciflua and Sassafras variifolium.

Sphaeropsis malorum Pk. on privet.

Stictis mollis Pers. on Maclura pomifera.

Thyridaria eutypoides Ell. & Ev. on Broussonetia papyrifera.

Tryblidiella rufula (Spreng.) Sacc. on Maclura pomifera.

Vermicularia compacta Ell. & Ev. on Dahlia.